Space Weather Forecast

Issued on Sunday, 11 December 2022 at 01:22 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate-class X-ray flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: No Earth-bound coronal mass ejections were observed in the period. Solar activity has been Low over the past 24 hours, though with an increasing amount of long period common-class flares.

There are currently eight sunspot regions on the visible disc. Three larger spots, with the most recent of these in the southeast of the disk being responsible for the vast majority of the aforementioned flares. The remaining numbered sunspot regions are all small, weak and magnetically simple, and generally stable.

Solar Wind / Geomagnetic Activity: Solar winds were indicative of the waning effects of a coronal hole fast wind. The solar wind speed was elevated, but trended back to slightly elevated. The Interplanetary Magnetic Field was weak and followed a declining trend also. The net result of the above solar wind measures was for mostly Quiet geomagnetic activity (Kp 1-2), with an initial Unsettled (Kp 3) period in the 00-03 UTC interval.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: There is a chance of isolated moderate-class flares each day, currently most likely from the sunspot group near the southeast limb. Further arriving regions into the coming UTC working week may see a further development of activity.

Solar Wind / Geomagnetic Activity: No Earth-directed coronal mass ejections currently feature in the forecast. Solar wind speeds are likely to remain at Slightly Elevated levels, perhaps with a declining trend. There is a Chance of these increasing to Elevated due to an unnumbered coronal hole on day 3 (13th), before falling back to Slightly Elevated by the end of the period.

The geomagnetic forecast is therefore expected to be mainly Quiet (Kp 0-2) with a Chance of isolated Unsettled or Active intervals (Kp 3-4), mainly on day 3 (13th).

Energetic Particles / Solar Radiation: No solar radiation storms are expected. This being said, there is a daily Very Slight Chance of seeing S1+ levels if any significant X-ray flares were to occur.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	5	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	40	40	40	40
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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